

Reg. No. :

Question Paper Code : 50428

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023

Fourth/Fifth Semester

Computer Science and Engineering

CS 8493 – OPERATING SYSTEMS

(Common to Electronics and Communication Engineering /
Computer Science and Business Systems / Information Technology)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the three main purposes of an operating system?
2. What is the advantage of using virtual machine architecture?
3. What is an atomic operation? What is indivisibility of an operation execution?
4. Define a system call.
5. What is cascading termination?
6. What is a process control block?
7. Which are the conditions that may lead a process to a deadlock state?
8. Define Thrashing.
9. List the various file attributes.
10. What is memory mapping of a file in Linux environment?

PART B — (5 × 13 = 65 marks)

11. (a) How various scheduling queues are utilized to execute a process?
Or
(b) How the cooperating processes share the common memory pool without making conflict? - Explain
12. (a) (i) Write the working process of system calls fork (), abort(), read(), write() with pseudo code. (8)
(ii) In a real time computing system, what kind of scheduling is applied - Explain. (5)
Or
(b) How the critical section is shared between reader and writer process, explain the algorithm how the Synchronization maintained among processes.
13. (a) (i) Discuss about multi- processor scheduling and when it is needed?(8)
(ii) How thread varies from process? Discuss the pros and cons of various thread models. (5)
Or
(b) Consider the following page reference string A,B,C,D,A,B,E, A,B,C,D,E,AB,D,C. Calculate the number of page faults, page miss and hit ratio, assuming 3 and 4 frames (initially the frames are empty) for the following page replacement algorithms - FIFO, Optimal, LRU.
14. (a) Explain the demand paging technique with a neat sketch.
Or
(b) (i) Describe about the swapping technique. (8)
(ii) List and discuss various methods for implementing a single level directory. (5)
15. (a) Give five memory partition of 100KB, 500 Kb, 200 KB, 300 KB and 600 KB in order, how would the first fit, best-fit and worst fit algorithms place processes of 212 KB, 417 KB, 112 KB and 426 KB. Which algorithm will makes the most efficient use of memory.
Or
(b) (i) Explain about windows operating system. (8)
(ii) Explain about file system networking. (5)

PART C — (1 × 15 = 15 marks)

16. (a) Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process	Burst Time	Priority
P1	6	3
P2	5	1
P3	2	3
P4	1	4
P5	4	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

- (i) Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a non-preemptive Priority (a smaller priority number implies a higher priority), and RR (quantum = 1) scheduling. (7)
- (ii) What is the turnaround time of each process for each of the scheduling algorithms given above? (4)
- (iii) What is the waiting time of each process for each of the scheduling algorithms given above? (4)

Or

- (b) List and discuss various methods for implementing various level directories with a diagram.